UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

fw

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/796,977 | 03/11/2004 | Sam S. Tsai | BHT-3230-99 | 4055 |

7590 08/23/2007

TROXELL LAW OFFICE PLLC
SUITE 1404
5205 LEESBURG PIKE
FALLS CHURCH, VA 22041

| EXAMINER | |
|---|---|
| FINDLEY, CHRISTOPHER G | |
| ART UNIT | PAPER NUMBER |
| 2621 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 08/23/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/796,977 | TSAI ET AL. | |
| | Examiner | Art Unit | |
| | Christopher Findley | 2621 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-25 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-25 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 6/09/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 1-25 are objected to because of the following informalities:

Claims 1-25 are directed to "a method and apparatus," while claims 1-17 should be directed to an apparatus, and claims 18-25 should be directed to a method.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**3. Claims 1-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Ye et al. (US 20060146937 A1).**

Re claim 1, Ye discloses an apparatus for interframe wavelet video coding, comprising: an encoder for inputting a video frame (Ye: Fig. 1, element 110; paragraph [0020]), comprising a Motion Compensated Temporal Filtering (MCTF) analyzer (Ye: Fig. 2, elements 204a-204n; paragraph [0030]), a spatial analyzer connected to said MCTF analyzer (Ye: Fig. 2, element 202; paragraph [0029], the transform spatially decomposes a video frame into bands), a Discrete Wavelet Transform (DWT)

coefficient encoder connected to said spatial analyzer (Ye: Fig. 2, element 202; paragraph [0029], each band is represented by wavelet coefficients), a packetizer connected to said DWT coefficient encoder (Ye: Fig. 2, element 212, multiplexing for transmission over a network indicates packetizing data), a motion estimator connected to said MCTF analyzer (Ye: paragraph [0031], each MCTF has a motion estimation unit), and a Motion Information (MI) encoder connected to said packetizer and said motion estimator (Ye: Fig. 2, element 210; paragraph [0040]); a decoder for outputting a video frame (Ye: Fig. 1, element 118; paragraph [0023]), comprising a de-packetizer (Ye: Fig. 4, element 402; paragraph [0043], the demultiplexer separates bands and motion vectors, indicating depacketizing), a DWT coefficient decoder connected to said de-packetizer (Ye: Fig. 4, element 410; paragraph [0046]), a spatial synthesizer connected to said DWT coefficient decoder (Ye: paragraph [0046], bands are transformed back into the spatial domain), an MCTF synthesizer connected to said spatial synthesizer (Ye: Fig. 4, element 408a-408n; paragraph [0045]), and an MI decoder connected to said de-packetizer and said MCTF synthesizer (Ye: Fig. 4, element 406; paragraph [0044]); and a puller connected to said encoder and said decoder, wherein said method and apparatus is to partition an MI for scalability and to transfer a partition of said MI to a terminal to achieve said scalability (Ye: paragraph [0029], separation of the signal into bands acts as a means for creating scalability).

Re claim 2, Ye discloses that said MCTF analyzer is to analyze said video frame on temporal axis and decompose said video frame into high-pass frames of high frequency and low-pass frames of low frequency by using a motion vector obtained from

said motion estimator so that an output of temporal high-pass frames and temporal low-pass frames is obtained by an input of said video frame )Ye: paragraph [0030]).

Re claim 3, Ye discloses that said spatial analyzer is to decompose temporal high-pass frames and temporal low-pass frames into spatial high-pass frames and spatial low-pass frames through Discrete Wavelet Transform (DWT) method so that an output of said spatial high-pass frames and said spatial low-pass frames is obtained through DWT method by an input of said temporal high-pass frames and said temporal low-pass frames (Ye: paragraph [0029]).

Re claim 4, Ye discloses that said DWT coefficient encoder is to encode said video frame in a compression way on spatial high-pass frames and spatial low-pass frames that are obtained by said spatial analyzer so that an output of a compressed video content bitstream is obtained by an input of said spatial high-pass frames and said spatial low-pass frames that are obtained through DWT method (Ye: Abstract section, lines 2-5, the signal is compressed; paragraph [0030], high-pass frames and low-pass frames).

Re claim 5, Ye discloses that said packetizer is to bundle a compressed video content bitstream and a compressed MI into a single compound compressed bitstream so that an output of said single compound compressed bitstream is obtained by an input of said compressed video content bitstream and said compressed MI (Ye: paragraph [0041]).

Re claim 6, Ye discloses that said motion estimator is to search for the motion vector of each said partition and continuously search through all said partitions and a compression is obtained by recording as a motion vector the corresponding block address of the minimal difference according to the relationship between two or more selected frames so that an output of an MI is obtained by an input of said two or more selected frames (Ye: paragraph [0038]).

Re claim 7, Ye discloses that said MI encoder is to split all motion vectors of all said partitions into a base layer and one or more enhancement layers and to apply entropy coding on said base layer and said enhancement layers to compress said MI applied with entropy coding so that an output of a compressed MI is obtained by an input of said MI (Ye: paragraphs [0040]-[0041]; each band is equivalent to a layer).

Re claim 8, Ye discloses that said MI encoder is to do partitioned coding to said MI according to three precisions of spatial precision, temporal precision, or numerical precision (Ye: paragraphs [0033]-[0034]).

Re claim 9, Ye discloses that said spatial precision is a partitioned motion block (paragraph [0034], fractional pel precision).

Re claim 10, Ye discloses that said temporal precision is a number of frames per second (Ye: paragraph [0033], the number of frames grouped together per band may be varied for complexity or resiliency requirements).

Re claim 11, Ye discloses that said numerical precision is a precision of the arithmetic expression of a motion vector (Ye: paragraph [0034], different fractional pel precisions will affect the expression of the motion vectors).

Re claim 12, Ye discloses that said MI decoder is to help rebuild related information of said motion estimator (Ye: paragraph [0043], the decoder performs the inverse functions of the encoder).

Re claim 13, Ye discloses that said DWT coefficient decoder is to apply compressed decoding on spatial high-pass frames and spatial low-pass frames that are obtained by said spatial analyzer so that an output of said spatial high-pass frames and said spatial low-pass frames is obtained by an input of a compressed video content bitstream (Ye: paragraphs [0044]-[0045]).

Re claim 14, Ye discloses that said spatial synthesizer is to rebuild temporal high-pass frames and temporal low-pass frames from spatial high-pass frames and spatial low-pass frames through Inverse Discrete Wavelet Transform (IDWT) method so that an output of said temporal high-pass frames and said temporal low-pass frames is obtained through IDWT method by an input of said spatial high-pass frames and said spatial low-pass frames (Ye: paragraphs [0045]-[0046]).

Re claim 15, Ye discloses that said MCTF synthesizer is to synthesize temporal high-pass frames and temporal low-pass frames into a video frame by using motion vectors so that an output of a video frame is obtained by an input of said temporal high-

pass frames and said temporal low-pass frames obtained through IDWT method (Ye: paragraph [0045]).

Re claim 16, Ye discloses that said MI decoder is to apply entropy decoding on said compressed MI and combine a base layer and one or more enhancement layers to form a motion vector so that an output of an MI is obtained by an input of a compressed MI applied with entropy decoding (Ye: paragraph [0025], MPEG includes entropy coding and decoding; paragraphs [0077]-[0079], base layer and enhancement layers).

Re claim 17, Ye discloses that said puller is to read bit-rate/frame-rate/image-size information to partition a compressed video content bitstream (Ye: paragraph [0032], band filtering depends on optimizing the efficiency/complexity constraints); to decide whether one or more enhancement layers are needed on said bit-rate/frame-rate/image-size (Ye: paragraph [0033], band filtering depends on optimizing the efficiency/complexity constraints); to send the MI of a base layer (Ye: Fig. 7; paragraphs [0068]-[0070], since the base layer is the layer with the minimum amount of information required for reconstructing a picture, its motion information is always sent); and to combine said partitioned compressed video content bitstream and a partitioned MI obtained by partitioning the MI of said enhancement layers according to said bit-rate/frame-rate/image-size, to form a compressed bitstream (Ye: paragraphs [0068]-[0070]).

Re claim 18, arguments analogous to those presented in claim 8 are applicable to claim 18, and, therefore, claim 18 has been analyzed and rejected with respect to claim 8 above.

Claim 19 has been analyzed and rejected with respect to claim 9 above.

Claim 20 has been analyzed and rejected with respect to claim 10 above.

Claim 21 has been analyzed and rejected with respect to claim 11 above.

Re claim 22, Ye discloses that said scalability is a capability of accepting demands according to one factor or a plurality of factors among bit-rate/frame-rate/image-size and said three precisions (Ye: paragraph [0032], band filtering depends on optimizing the efficiency/complexity constraints).

Re claim 23, Ye discloses that said MI is a motion vector and related data that helps to rebuild said motion vector (Ye: Fig. 7; paragraph [0070], the encoder includes motion vector coding).

Re claim 24, Ye discloses that said video compressing method is an Interframe Wavelet Video Coding method (Ye: paragraph [0025], MPEG compression includes both intra frame and inter frame compression; Abstract section, lines 2-5, compression is done in the wavelet domain).

Re claim 25, Ye discloses that said video compressing method is a video encoding method with motion information (Ye: paragraph [0030]-[0031], motion estimation and motion compensation are included in the compression).

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a. 3-D morphological operations with adaptive structuring elements for clustering of significant coefficients within an overcomplete wavelet video coding framework

Turaga et al. (US 20070110162 A1)

b. Motion compensated temporal filtering based on multiple reference frames for wavelet based coding

Turaga et al. (US 7023923 B2)

c. Method for coding a video image taking into account the part relating to a component of a movement vector

Boisson et al. (US 20070189389 A1)

d. Scalable encoding and decoding of interlaced digital video data

Marquant et al. (US 20070147492 A1)

e. Fully scalable 3-d overcomplete wavelet video coding using adaptive motion compensated temporal filtering

Ye et al. (US 20060008000 A1)

***Contact***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Findley whose telephone number is (571) 270-1199. The examiner can normally be reached on Monday-Friday 7:30am-5pm, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Findley/